WE CLAIM:

1.   A system for performing wireless communications, comprising:

a broadcast transmitter configured to transmit broadcast information over a wide area on a predetermined schedule;

a localcast transmitter configured to transmit local information over a local area, wherein the local area is smaller than the wide area; and

a mobile device including a receiver, the receiver being configured to receive the broadcast information and the local information.

2.   A localcast transmitter, comprising:

a first interface;

an encoder coupled to said first interface;

a packet assembler coupled to said encoder;

a control function coupled to said first interface, said encoder and said packet assembler;

a modulator; and

an antenna.

3.   The localcast transmitter in claim 2, wherein the localcast transmitter is further comprised of a data source for a local area transmission system.

4.   The localcast transmitter in claim 2, wherein the first interface is further comprised of at least one of a USB-compatible interface, an RS-232 interface, and an IEEE-1394 interface.

5.   The localcast transmitter in claim 2, wherein the control function collects transmit packets from the data source and performs handshaking functions.

6.   The localcast transmitter in claim 2, wherein the localcast transmitter further comprises a second encoder.

7.   The localcast transmitter in claim 2, wherein the packet assembler further performs the steps of interleaving encoded system information into data segments; adding correlation information to said data segments; and converting said data segments into a bit stream.

8.   The localcast transmitter in claim 2, wherein the localcast transmitter is further configured to broadcast in a locally-unused portion of the FM band.

9.   The localcast transmitter in claim 2, wherein the data source is further comprised of a personal computer system.

10.   The localcast transmitter in claim 2, wherein the encoder is further comprised of a first convolutional encoder for system information.

11.   The localcast transmitter in claim 10, wherein the encoder is further comprised of a second convolutional encoder for data.

12.   A broadcast transmitter, comprising:
        an input-output controller coupled to a first input interface and to a buffer memory;
        a control processor coupled to said input-output controller and to a second input interface;
        a precision time base coupled to said microprocessor;
        an encoding engine coupled to said input-output controller, said control processor, and to a first memory; and
        a subcarrier signal generator, coupled to said encoding engine, said control processor, a second memory, and to a subcarrier output.

23

13.   The broadcast generator in claim 12, wherein the control processor includes at least one of a microprocessor, microcontroller, programmable logic array, programmable gate array, and an ASIC.

14.   The broadcast generator in claim 12, wherein the input-output controller comprises a field-programmable gate array.

15.   The broadcast generator in claim 12, wherein the first input interface further comprises at least one of an RS-422 interface, an RS-232 interface, an IEEE-1394 interface, a USB interface, or an Ethernet interface.

16.   The broadcast generator in claim 12, wherein the second input interface further comprises at least one of an RS-232 interface an RS-422 interface, an RS-232 interface, an IEEE-1394 interface, a USB interface, or an Ethernet interface.

17.   The broadcast generator in claim 12, wherein the precision time base is comprised of a 1-ppm oscillator.

18.   The broadcast generator in claim 12, wherein the subcarrier signal generator is further comprised of a modulator, a digital-analog converter, and an output filter.

19.   The broadcast generator in claim 18, wherein the modulator is further comprised of a field-programmable gate array.

20.   A mobile device, comprising:

an antenna assembly;

a real-time component comprising:

a system timing function,

a real-time event dispatching function,

and a digital radio;

a digital control and processing circuit;

a microcomputer assembly;

a random access memory;

a nonvolatile memory; and

a microprocessor-controlled user interface.

21.   The mobile device in claim 20, wherein the mobile device is further configured to be worn on a person's wrist.

22.   The mobile device in claim 21, wherein the mobile device is further configured to display the current time.

23.   The mobile device in claim 20, wherein the mobile device is further configured to operate within a paging unit.

24.   The mobile device in claim 20, wherein the mobile device is further configured to operate within a cellular telephone.

25.   The mobile device in claim 20, wherein the mobile device is further configured to receive information content from a local-area transmitter and from a broadcast transmitter.

26.   The system in claim 20, wherein the mobile device further comprises a transceiver.

27. The system in claim 26, wherein the mobile device is further configured to transmit and receive information from a second mobile device.

28. The system in claim 27, wherein the mobile device is further configured to transmit and receive information from a plurality of mobile devices.

29. The mobile device in claim 20, wherein the mobile device is further configured to receive local information from a second mobile device.

30. A method of re-broadcasting data transmitted over an FM subcarrier, comprising the steps of:

      receiving at a localcast transmitter the transmitted data;

      locally formatting said transmitted data for local-area wireless transmission; and

      retransmitting said locally formatted data from said localcast transmitter to a local area.

31. The method of communicating information in claim 30 further comprising the step of adding local content information in said localcast transmitter to said locally formatted data for transmission over a local area.

32. The method of communicating information in claim 30 further comprising the step of adding application information in said localcast transmitter to said locally formatted data for broadcast over a local area.

33. The method of communicating information in claim 30 further comprising the steps of receiving said locally formatted data at a first mobile device; and retransmitting said locally formatted data from the first mobile device to a second mobile device.

34.   A method of encoding a data stream, comprising the steps of:

partitioning said data stream into a plurality of data packets at a transmission network center;

transmitting said data packets to a broadcast generator;

receiving said transmitted data packets at said broadcast generator;

writing said received data packets into an I/O memory of said broadcast generator;

reading a plurality of extracted data packets from said I/O memory in an order that differs from the order in which said received data packets arrived at said I/O memory block;

encoding said extracted data packets into encoded data streams; and

interleaving said encoded data streams into a plurality of interleaved data segments.

35.   The method of claim 34, further comprising the steps of:

determining whether a threshold amount of memory within said I/O memory has been filled by said received data packets; and

initiating encoding of said received data packets if said determination is affirmative.

36.   The method of claim 34, further comprising the steps of:

indicating, within each of said data packets whether each of said data packets requires lower-latency transmission time; and

modifying said interleaving based on whether said data packets require lower-latency transmission time.

37.   The method of claim 34, the encoding further comprising the steps of:

performing a bitwise-exclusive-OR between each bit of said extracted data packets and each bit of a data pattern to produce a plurality of whitened data streams; and

convolutionally encoding said whitened data streams thereby producing a plurality encoded data streams.

38. A method of transmitting data, comprising the steps of:

receiving a data stream including a plurality of data packets, wherein at least some packets are designated as intended to be transmitted with low-latency; and

interleaving said data packets over a frame except that the data packets designated as intended to be transmitted with low-latency are interleaved over a sub frame of the broadcast frame.

39. The method of claim 38, wherein said sub frame is one-fourth of said broadcast frame.

40. An apparatus for transmitting a signal in a wireless communications system including a data source, comprising:

a localcast transmitter coupled to the data source and configured to transmit to a device over a local area and in a locally-unused FM frequency, wherein the device is:

configured to receive transmitted data from the localcast transmitter, and

further configured to receive transmitted data from a wide-area broadcast transmitter.

41. An apparatus for transmitting a signal in a wireless communications system including a data source, comprising:

a localcast transmitter coupled to the data source and configured to transmit to and receive data from a device over a local area and in a locally-unused FM frequency, wherein the device is configured to receive the transmitted data from the localcast transmitter and to transmit other data to the localcast transmitter.

42.   An apparatus for performing wireless communications, comprising:

a device configured to receive a wireless communication transmitted in a broadcast mode, wherein the broadcast mode includes data transmitted over a wide area transmission medium, the device being further configured to transmit and receive additional wireless communications transmitted in a localcast mode, wherein the localcast mode includes data transmitted or received over a local area transmission medium.

43.   An apparatus for performing wireless communications, comprising:

a mobile device configured to receive a wireless communication transmitted in a broadcast mode, wherein the broadcast mode includes data transmitted over a wide area transmission medium, the mobile device being further configured to receive additional wireless communications transmitted in a localcast mode, wherein the localcast mode includes data transmitted over a local area transmission medium.